

WHAT IS CLAIMED IS:

1. An internal broaching machine comprising:
 - a broach having a front shank or pull end and a rear shank or follower end, at least one of said pull end and said follower end being formed with a tapered surface;
 - a pull head and a retrieving head for respectively gripping said pull end and said follower end, at least one of said pull head and said retrieving head being formed with a tapered inner surface complementary to said tapered surface of said one of the pull end and the follower end; and
 - a means for firmly connecting the heads and the broach together by pressing and clamping the tapered surface of the broach against the tapered inner surface of the head.
2. An internal broaching machine according to claim 1, wherein said tapered surface is formed on the pull end of said broach, and said complementary tapered inner surface is formed on the pull head.
3. An internal broaching machine according to claim 1, wherein said head for gripping the one broach end is the retrieving head, and said means for pressing the broach against the head comprises a push device provided on a slide table for supporting the retrieving head and adapted to press the retrieving head against the broach through the slide table.
4. An internal broaching machine according to

claim 1, wherein said broach is formed at both the ends thereof with tapered surfaces, said heads are both pull heads each provided with pull mechanisms for pulling the broach and are each formed with tapered inner surfaces complementary to the corresponding tapered surfaces of the broach, and said means for pressing the broach against the head comprises the pull mechanisms.

5. An internal broaching machine according to claim 2, wherein said pull mechanism comprises a pair of engagement grooves formed in opposite sides of one of the ends of the broach and each having tapered surfaces on a terminal side of the broach, a pair of radially oriented holes oppositely formed in the pull head, claw members slidably received in the holes respectively, and a sleeve slidably mounted on the pull head and having inward projecting portions for engaging and pushing the claw members, so that when the sleeve is moved, the projecting portion of the sleeve thrusts the claw members against the tapered surfaces of the broach engagement grooves to pull the broach toward the pull head.

6. An internal broaching machine according to claim 1, wherein said pull head further comprises a rotary direction positioning mechanism which comprises a pair of parallel flat faces formed on opposite sides of one of the ends of the broach, a pair of parallel holes radially formed in the pull head, pins slidably received in the holes respectively, and a sleeve

slidably mounted on the pull head and having an inward projecting portion for engaging and pushing the pins, so that when the sleeve is moved, the projecting portion of the sleeve thrusts the pins against two ends symmetric with respect to a point of the parallel flat faces of the broach to rotate the broach from opposite directions and thereby clamp the broach with the pull head.

7. An internal broaching machine according to claim 3, wherein said push device comprises a drive cylinder mounted on the slide table and a movable block movably mounted on the slide table, drivingly connected to the cylinder and adapted to support the retrieving head.

8. A broach for internal broaching comprising a front shank or pull end, a rear shank or follower end, and a tapered surface formed on at least one of said pull end and said follower end, said tapered surface being complementary to a tapered inner surface formed in a head of a broaching machine for drivingly gripping the one broach end.